U-2 Airframe

Mr. Stephen Kaldon

28 July 2004

03-021: AC Generator Power Factor Upgrade

Control Number: 03-021
Issue Title: AC Generator Power Factor Upgra
Affected Capabilities: Airborne Sensors Operation

POC: Stephen Kaldon, WR-ALC/LXAA
Affected Programs: Airborne sensors

Issue Description: The AC generator cannot support all mission configurations with RAS-1R due to the power factor influence from the RAS-1R system.

Impact of Integration	**S**
Probability of Integration	**VL**
Capability / Integration Risk	**H**
Integration Funding Status	**P**
PM/CE Assessed Priority	**H**

Impact Assessment: Many configurations requiring AC power near the upper limit of the AC generator cannot be supported due to the power factor influence on the overall performance of the generator.

Mitigation Plan:

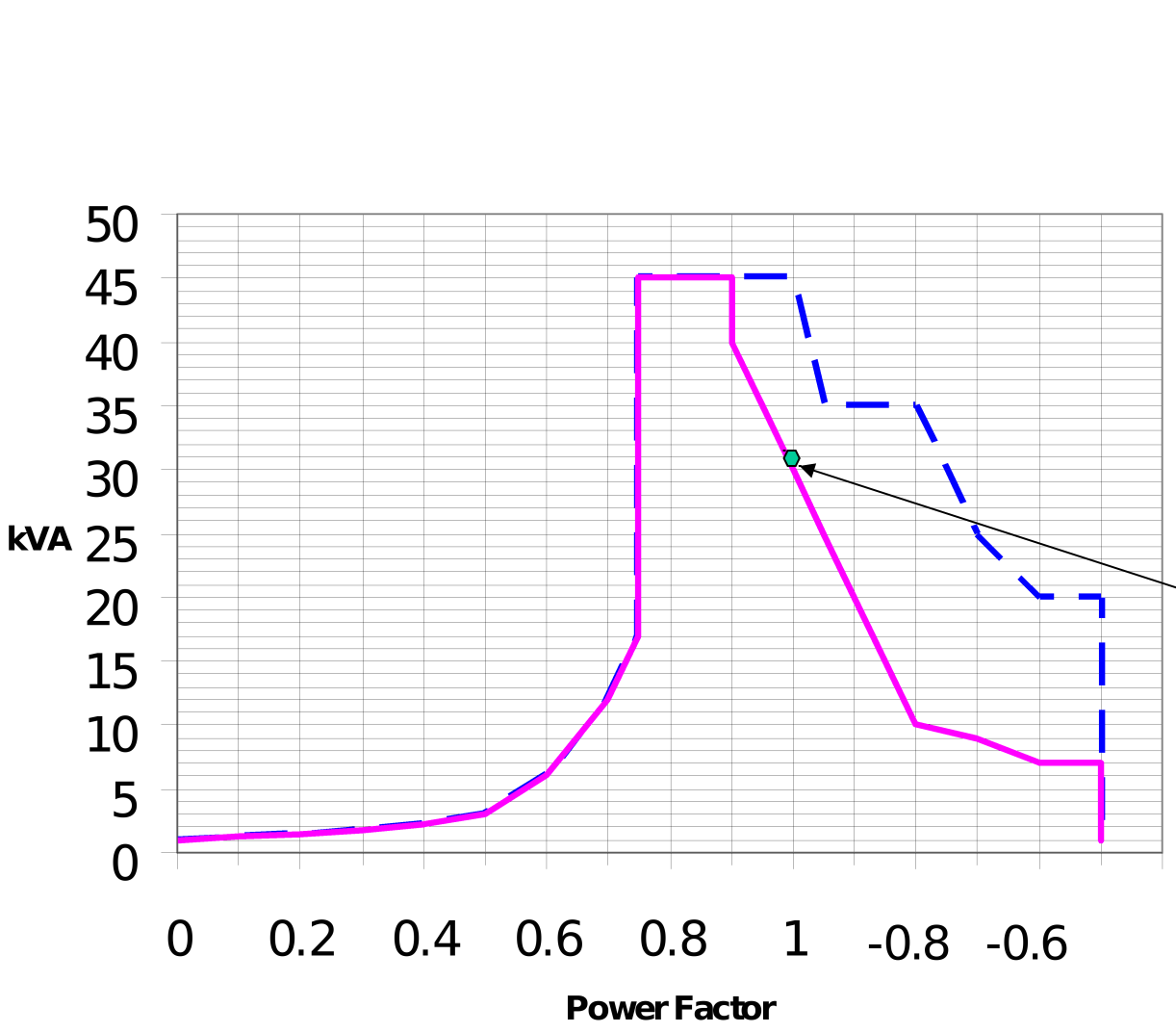
Probability Mitigation Tasks:	Original	Revised	Actual
Modify the generator to handle the power factor influence From the RAS-1R system	Feb 03		Feb 03
Perform Endurance testing on the modified generator	Oct 03	CY 04	
Begin generator fleet modification	FY 06		

Impact Mitigation Tasks:	Original	Revised	Actual

Status: Funding received at LM Aero to start endurance testing. Fleet modification funding is being put into the POM for FY06.

Recommendation: Exit criteria is: Complete flight testing of modified generators and begin production run to modify all fleet generators. ECD: FY07.

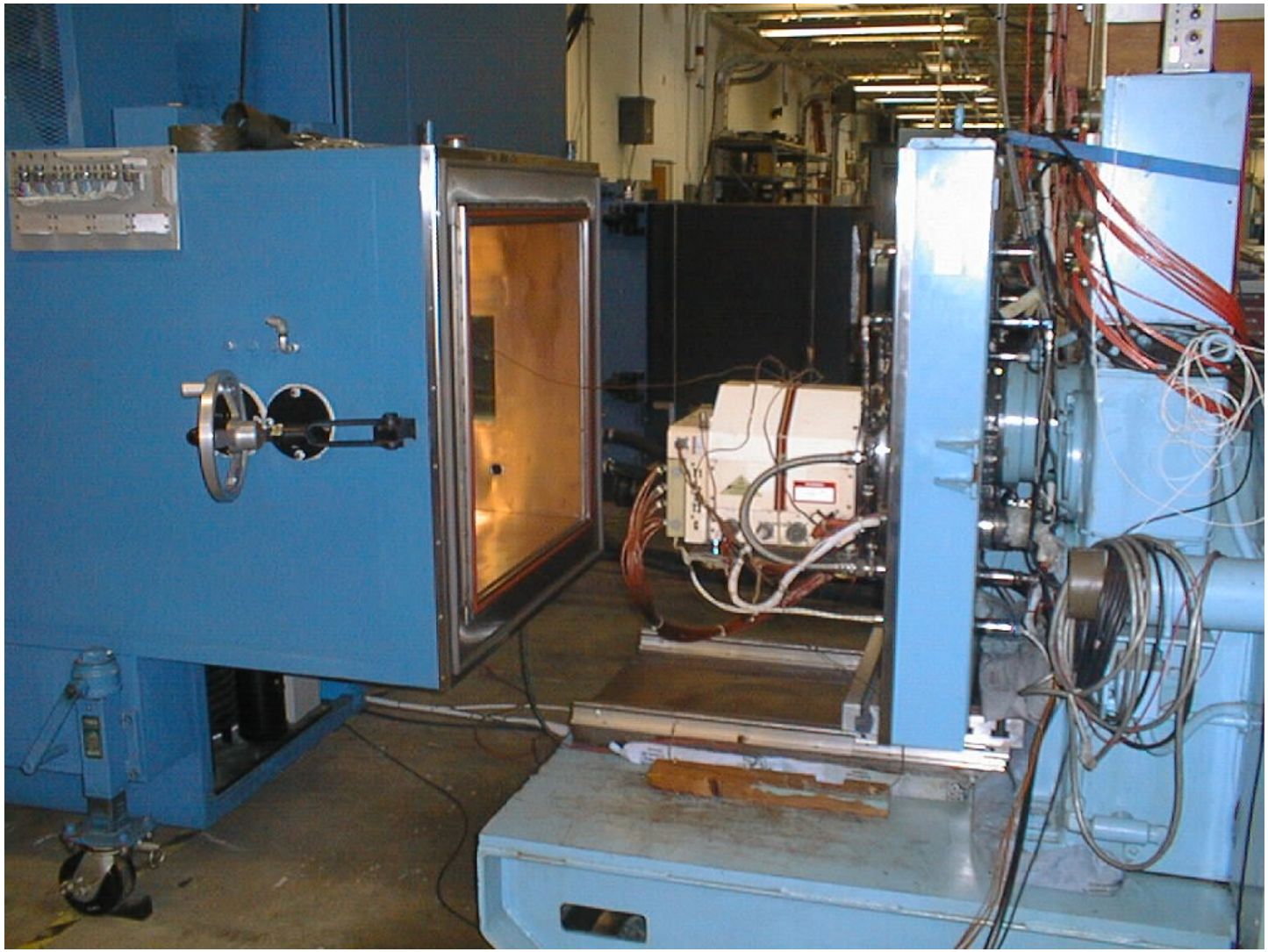
03-021: AC Generator Power Factor Upgrade



Note: "New Load kVA" is before Endurance Testing

Problem Loads

03-021: AC Generator Power Factor Upgrade
Endurance Test Set-up



03-021: AC Generator – Additional Issues

- Envelope expansion removes generator as main power production limit
  - Generator capable of 45kVA at pf=1 (45kW)
  - Aircraft incapable of 45kVA at pf=1 due to AMAD oil cooling and engine HP limits
- AMAD Oil Cooling
  - System at limit with current aircraft loads
  - Must optimize cooling for all loads and flight regimes: (Need louvers for AMAD heat exchanger)
- Engine HP extraction
  - Current 91 HP limit provides 36 kW from AC generator
  - Engine requires qualification for higher HP extraction

Backwards Compatibility

Block 10 BWC Jets: 1070, 1073, 1076, 1077, 1083, 1089, 1096

Block 20 BWC Jets: 1066*, 1069*, 1079*, 1080, 1081, 1082, 1085

* PDM deliveries late CY04.

Status:

- Have not flown ASARS2 on a Block 20 BWC at Det-4 yet.
- Wiring with data link resolved in field but remains a configuration control issue.
- Retention of BWC in Block 10 -> Block 20 mod?
- Will extend POP to support Det-1 and 5RS deployments (in scope).